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ABSTRACT

International knowledge and economic competitiveness are linked from three perspectives because appropriate connections are currently not being made between global economic change, the competitiveness of the American economy, and the international aspects of American higher education. Sections provide discussions of the following: an introductory metaphor; international knowledge defined; competitiveness defined; the problem of American competitiveness; New England in the pattern; strategies for competitiveness; lessons from Japan (international knowledge as business strategy); New England leaders' confirmation that international knowledge is a strength; eight linkages of competitiveness and international knowledge (e.g., the need for knowledge to compensate for a weak tradition, linkage of productivity lag and parochialism, increased export activity requiring international knowledge, and global perspective as essential); other studies and reports; and the New England leadership survey. New England leaders perceive a need to refocus what higher education is doing, so there is a challenge ahead for educational leadership and creativity with regard to both business preparation and citizenship education for the global economy. Tables are included. (SM)

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NEW ENGLAND BOARD OF HIGHER EDUCATION

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ECONOMIC COMPETITIVENESS AND INTERNATIONAL KNOWLEDGE

Sven Groennings
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Staff Paper II
October 1987

A Regional Project on the Global Economy
and Higher Education in New England

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ECONOMIC COMPETITIVENESS AND INTERNATIONAL KNOWLEDGE

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FOREWORD

THE PROJECT ON THE GLOBAL ECONOMY AND HIGHER EDUCATION IN NEW ENGLAND

In the Spring of 1986, the New England Board of Higher Education voted to endorse a significant regional initiative, "The Project on the Global Economy and Higher Education in New England." The initiative grows out of the Board's blue-ribbon Commission on Higher Education and the Economy of New England which found that engaging higher education as an international resource is one of the most important ways of positively influencing the economy of the region.

The New England economy is today the most robust in the nation with the lowest regional unemployment rate and highest level of personal income in the United States. In terms of international markets and investments, New England is one of the most intensive regions in proportion of products dependent upon export trade. Between 1980 and 1985, direct international trade in New England doubled to more than $30 billion making New England's economic future tied increasingly to the global outreach and competitive capacity of the region's knowledge-intensive economy.

New England, as many of the region's political leaders emphasize, has a growing need for internationally aware citizens. According to the most recent Annual Survey of Manufacturers: Origin of Exports, New England is one of the most export-intensive regions in the United States. Connecticut (15 percent), Massachusetts (13.8 percent), and Vermont (14.8 percent) all top the U.S. average of 11.3% in percent of exported manufactured goods and rank in the top seven among all states.

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New England also ranks high in the level of direct foreign investment. The region's university research and development, and skill in technology transfer are highly regarded throughout the world. Yet, addressing internationalization in New England requires a carefully coordinated economic, political and educational effort. A gap exists between the region's educational realities and what is needed to achieve economic competitiveness, including public understanding. The public, nationally and in New England, is largely unaware of the role that economic affairs between the United States and its trading partners plays in the vitality of the domestic economy.

The impact of international competitiveness on state and local economies and family budgets has created concern among Americans at the same time they have welcomed the quality and price advantage of imported products. Today, 80 percent of all American-made goods compete with international rivals. Half of the revenues of U.S. advertising firms and one-third of "Big Eight" accounting firm fees are derived from overseas.

The higher education community must bring a new creative vision to the broad and culturally significant dimensions of the international marketplace. A particularly dramatic reflection of the problem is the national and regional decline in the study of foreign languages in our colleges: Recent reports indicate that the number of bachelor's degrees awarded in foreign languages dropped 49 percent in the past decade. Only recently have we begun to see a renewal of interest in the importance of language study.

The accelerating process that is internationalizing higher education in New England, although innovative, remains characteristically piecemeal and competitively uncoordinated. While traditional campus-abroad programs abound and international studies are expanding, they remain unlinked to international economic realities and to new corporate developments in New England.

The international programs of state government agencies in tourism, trade missions, manufacturing exports and financial services are unfamiliar to most professors of international studies. Foreign consulates and international visitors in New England find the region's complex array of educational initiatives bewildering. Those with whom we have had discussions, however, are open to creating imaginative working arrangements, and express considerable awareness of the necessity for a coordinated New England program and the essential role higher education will play.

Within higher education, international knowledge must become part of both general and professional studies. After years of mounting specialization within academic disciplines, the integration of an international economic perspective is necessary. Sven Groennings has pointed out that leaders in academia and government, especially state government, need fresh rationales and intellectual linkages to economic realities and problems.

The regional economy is increasingly integrated with international markets and investments, and at the same time grows more knowledge-intensive, producing innovative technological goods and services in ever-widening circles of international competition. New England's sophisticated professsional services sector is becoming international in scope. These are major changes at the cutting edge of regional economic development. Historically, higher education has adapted and contributed powerfully to changes in society, the economy, technology and national priorities. At issue now is how the relationship between the internationalization of the economy and the development of higher education's capabilities can be advanced most constructively in an era of global competitiveness. New England should take the lead.

During the past 18 months the New England Board of Higher Education has investigated and analyzed the dimensions of internationalization of the New England economy, the international programs and resources of higher education within the region, and the historic and current role of New England's colleges and universities.

Melvin H. Bernstein has conducted the economic analysis for the project; Richard King has reviewed the international student patterns of the region; and Sven Groennings has developed the first comprehensive regional overview of the "ubiquitous" level of change which today pervasively influences the development of academic planning throughout the region.

"Economic Competitiveness and International Knowledge" is the second in a series of special papers released by the Global Economy Project. Others will follow throughout the 1987-88 academic year with the belief that a compelling regional vision of the new role colleges and universities must play in international economic development is essential to the future well-being of New England.

John C. Hoy
President
New England Board of Higher Education

EXECUTIVE SUMMARY

The premise which led to this paper was that appropriate connections are not being made between global economic change, the competitiveness of the American economy, and the international aspects of American higher education. Indeed, we spoke of "missing links."

This paper links international knowledge and economic competitiveness from three perspectives.

The initial focus is on the problem of American competitiveness, which frames the sections following. This first section also introduces a wide range of strategic approaches to improving competitiveness and places the role of higher education in this context. It contends that higher education has not addressed the international dimension of its possible contributions to competitiveness as systematically or consequently as it has its technical and scientific functions.

Secondly, the paper draws lessons from Japan as the United States' foremost competitor, with particular attention to international knowledge as a strategic factor in Japanese business success. This comparative perspective underscores the importance of developing international knowledge.

Thirdly, the paper presents survey research data and testimonial evidence which link competitiveness and international knowledge. In addition to reviewing findings and implications for higher education presented in other studies, which are sparse, it confirms the importance of international knowledge by presenting 1987 New England leadership survey data on perceptions of the effectiveness of higher education in preparing us for participation in the global economy and ways in which it best can do so. Ranked first, stunningly, among corporate, government and higher education respondents was: "Design an undergraduate curriculum which ensures understanding of a global economy." Clearly, this is but one approach among many, yet a challenge

whose time has come.

A second staff paper reviews what is happening on New England campuses and why and the extent to which change is linked to the coming of the global economy.

These papers are intended to stimulate thinking about ways in which colleges and universities can address the challenge of the global economy and the improvement of America's economic competitiveness, in which higher education has a major stake.

These are interim papers, developed as part of a larger project on New England's higher education in a global economy undertaken by the New England Board of Higher Education.

ACKNOWLEDGEMENTS

This paper has been prepared as part of a broader project on New England's higher education in a global economy.

Corporate support for the larger project has been provided by AT&T, Bank of Boston, Bank of New England, Boston Globe Corporation, and The Henley Group.

My colleague Melvin H. Bernstein contributed helpful thinking, Tables 1 and 2, and the essence of several paragraphs including "New England in the Pattern," page 11.

JoAnn Moody commented helpfully upon the first draft. Our colleague Judith A. Beachler directed the survey research and provided the data on New England leadership perspectives. The data are reported in The Future of New England: A 1987 Survey of Business, Government and Higher Education Leaders, a survey conducted by the New England Board of Higher Education in cooperation with the New England Center for Continuing Education at the University of New Hampshire and with the support of the W.K. Kellogg Foundation.

ECONOMIC COMPETITIVENESS AND INTERNATIONAL KNOWLEDGE

The skill, dexterity and knowledge of a nation's people is the most powerful engine of its economic growth.

- Adam Smith

The Wealth of Nations

Introductory metaphor

There is a new "game" in town, and in communities across the country, it is the talk of the town. It is called "global economy." Americans are competing in a global marketplace, indeed are participating in it at the department store, grocery store and gas station. Eighty percent of all U.S. products face foreign competition. Every sixth worker and nearly every third acre in this country are producing for export.

The White House has used the metaphor of a "level playing field," in the sense that rules affecting trade must not tilt to the advantage of any country player. It is a "playing field" different from the domestic one to which we are accustomed, much larger and with more and different players. To "play," one needs more than well-made products. One needs to know about the condition of the "turf" and the capabilities and moves of one's competitors and to move

onto this global "playing field" to meet the competition capably, making good moves in production, marketing, finance, management and negotiation. Some of the competitors, not least Japan and West Germany, are veteran players.

The stakes in this "game" are high. The U.S. must "play" in order to prosper, but we face a problem: In 1986, the U.S. had a trade deficit of $156.2 billion, a record deficit in a series of record deficits. This is a dramatic measure of a declining competitiveness whose significance is very broad. Reduced competitiveness means lost sales, lost jobs, and a lower standard of living; it has caused plant closings resulting in people moving from the "Rust Belt" to the "Sun Belt." It erodes the tax base for public services and national defense. It means that increasingly important decisions about American economic life will be made in other countries, and because economic strength is a requisite of international leadership, it will weaken America politically.

The global economy is changing the framework of corporate and political decisions. It also frames the current discussion of needs at all levels of education, as education for competence in a global economy has become a challenge to the nation. Because the global economy affects everybody, also citizen education becomes important.

What is the problem? Why isn't America more competitive? Some blame the rules of the game, some blame our team managers, and some say we need to learn how to play better.

<u>This paper will</u> link competitiveness and international knowledge. It will focus on:

-- competitiveness as an American problem and place the development of international knowledge in the context of other strategies for increasing American competitiveness

-- lessons from Japan as the United States' foremost competitor, with particular attention to international knowledge as a strategic factor in Japanese business success
-- the role of higher education in contributing to American competitiveness
-- New England leadership survey data on perceptions of the effectiveness of higher education and ways in which colleges and universities can prepare the workforce for a global economy.

It will be best to try to avoid confusion by defining both international knowledge and competitiveness.

International knowledge defined

Having defined the game as "global economy," the meaning of international knowledge in this context becomes clear: knowledge of the global economic system, including international markets, and mastery of the skills needed to meet culturally diverse competitors on the global playing field; also, citizen understanding of the game, its players, rules, handicaps, scorekeeping and what is needed to be competitive.

Competitiveness defined

The President's Commission on Industrial Competitiveness in 1985 defined competitiveness as

> "....the degree to which a nation, under free and fair market conditions, produces goods and services that meet the test of international markets while simultaneously maintaining and expanding the real incomes of its citizens."

That is an excellent definition and has been adopted by the Council on Competitiveness. It is virtually identical to the one used by the Harvard Business Review, and it is the one we will use.

Unfortunately, "competitiveness" has been used in so many contexts that it has become a term of jargon having many meanings. What has been the nature of this confusion? At once, in common parlance, "competitiveness" refers to the objective condition of being competitive as well as the strategic objective of becoming competitive, and "competitiveness issues" include everything somehow relevant to the objective. At the same time, the term is relative; one's competitiveness is greater or lesser and increases or decreases, both across time and in relation to others. While the individual firm is understood to be competitive when it makes a profit, any industry is understood to be so in terms of its ability to sell in the world market. There is furthermore something especially facile in the usage when it conveys a simplistic we-they, win-loss connotation to a problem which is manifest in trade imbalances between countries and whose solution may include collaborative strategies involving the establishment of production facilities, marketing organizations and service networks overseas to gain higher shares of world output and world trade. Despite these difficulties, competitiveness remains a centrally important concept.

It may be useful to elaborate our operational definition in an explanatory way. What we mean by "competitiveness" is the ability of the American economy or segments thereof to sell goods and services in the world market. Yet that definition is incomplete until we ask: sell how much? the answer must be: sell enough to earn a rising standard of living, a condition that can only be met by being a leader in the principal innovative, newly developing industries. The concept of competitiveness has become international because the economy has become international. By world market we no longer mean only the foreign market. The world market includes Boston as well as London; foreign business competes with New England business in New England while New England business competes abroad.

The Problem of American Competitiveness

Business and political leaders, by clarion calls, have proclaimed that restoring American competitiveness is the greatest problem and action imperative facing the United States, perhaps for the rest of the century. The Conference Board, the largest business research group in the United States, in 1986 found that 88% of America's business leaders believe that international competitiveness should be a top national concern. There is discussion in the Congress, state legislatures and chambers of commerce about economic competition and "competitiveness issues." Competitiveness is certain to become a centerpiece of the 1988 political campaigns.

Two tables provide introductory perspective. Table I shows that U.S. market share has been declining in the face of stronger foreign competition and the rate of American productivity growth has slumped badly in comparison to our trading partners.

Table I

U.S. Competitive Position

Indicator

	1960		1985
U.S. Share of World Exports	18.0%		11.9%
Labor Productivity Increase Per Worker, 1969-1985	U.S. 0.7%	EUROPE 2.3%	JAPAN 4.0%

Annual Growth in Domestic Product Per Employed Person, 1973-1983	U.S.	S. Korea	Japan	W. Ger.	France	U.K.
	.3%	4.5%	2.8%	2.3%	2.2%	1.4%

Source: U.S. Department of Commerce; The OECD Observer (1987)

Table 2 shows the small share international trade represents of Gross National Product in the United States compared with other countries. The negative trade balance for the U.S. compares unfavorably with all countries listed with the exception of the People's Republic of China. Most U.S. trading partners are much more actively engaged in foreign trade than this country. The U.S. relied heavily on expansion in its own domestic market until recent years.

Table 2

WHO DEPENDS ON INTERNATIONAL TRADE

RATIO OF EXPORTS AND IMPORTS TO

GROSS NATIONAL PRODUCT BY COUNTRY

Country	Exports (%)	Imports (%)	Total Dollar Value
United States	5.3	9.1	604.4
Japan	13.2	9.8	338.4
Canada	27.8	24.5	175.0
United Kingdom	22.3	24.1	233.1
West Germany	29.2	25.2	434.4
France	19.7	21.1	254.3
Italy	21.3	24.4	170.1
Korea	35.6	37.5	68.4
China	12.0	18.6	69.8

Source: Boston Globe, November 9, 1986

Since 1981, the last year in which the United States had a trade surplus, and at least through 1986, we Americans have been buying increasingly more from foreign producers than we have been selling to foreign consumers. The 1986 trade deficit of $156.2 billion exceeded that of 1985 by 15%. From 1975 to 1985, U.S. imports surged by an annual growth rate in excess of 13% while exports grew at little more than half that rate at slightly more than 7% per year. Approximately one-fifth of all goods sold in the United States comes from abroad.

The United States has been losing its market share in eight of the 10 largest technology-intensive manufacturing industries. In 1986, for the first time, there was a trade deficit, amounting to approximately $3 billion, in high technology products, a key sector for America's and New England's economic growth, a sector which is basic to a wide range of new developments. Among everyday items, foreigners produce nearly all the videocassette recorders sold in the United States, two-thirds of the shoes, and nearly a third of the automobiles. A decline in any major industrial sector, for example automobiles, has ripple-out effects into ancillary industries; decline causes decline. The United States share of machine tool exports has dropped from 23% in 1964 to 4% in 1987. In the 1980s the United States has retrogressed from being the world's largest creditor nation to the world's leading debtor country; whereas in 1981 the U.S. held $140 billion more in foreign assets than foreigners held in the U.S., by the end of 1986 foreigners held $264 billion more in U.S. assets than Americans held overseas. It is conceivable that by 1990, the United States will owe foreigners as much as $700 billion.

There is no single cause of this decline, but rather a set of inter-related contributing factors. Some are external to the United States; others, such as government policies and consumer proclivities, are external

to the corporations, which in turn are affected by the competitive stockmarket and the mindset through which we view the world. There is a very large circular chain of causes.

The world economy has changed drastically in the years since 1945-1960 when U.S. domination in international trade was unrivaled and foreign competition in the American domestic market was only a minor force. It was inevitable that the dominance of the United States in the world economy for the first quarter century after World War II would be eroded as the Japanese and European economies returned to productivity and as the European Community improved European competitiveness. Moreover, many other countries became industrialized, their industries operating with modern plant and low-cost labor. The world position of the United States shifted greatly from 1950 to 1980: from 40% to 21% of the world product; from 20% to 11% of world trade. The United States, as the world's largest and richest country, is a magnet to other countries' exporters, which design their products for this market; for many American firms, foreign markets have seemed scattered, varied in access, troublesome, small and marginal to the home market.

The impact of the rest of the world upon the American competitive position has been manifest in other ways also. The oil crisis of the 1970s caused inflation in the United States and the transferring of enormous sums to Mideast countries. Much of that money was recycled by major American banks to third world countries, whose ability to pay back the loans has been undermined by high American interest rates and by economic growth and export earnings inadequate either to service the growing debt or to buy American exports. Debt-ridden Latin American countries have reduced their importation of American goods by tens of billions of dollars during the 1980s, with consequent losses of perhaps hundreds of thousands of American jobs.

In the 1980s, with the development of the global economy which is more integrated internationally than the earlier trading economy, there have been numerous acquisitions and mergers, some by American firms. The number of U.S. firms acquired by foreign companies increased by more than 50% between 1982 and 1985, and the subsequent lower price of the dollar is accelerating this trend. There is considerable evidence that foreigners have been able to pay higher average prices for their acquisitions than have Americans. Mergers and acquisitions increasingly are vehicles by which foreigners are positioning themselves for the American market.

Expenditures for national security are far greater for the United States than for its economic competitors, and a far larger share of its research and development expenditures has been focused on defense and space programs. Whereas Japan is spending 1% of its GNP on defense, the United States is spending 6%. Both the Vietnam War and the recent renewal of military capability during the Reagan Presidency have been financed in large part by borrowing rather than by increasing taxes.

The federal budget deficit, which in 1986 was $230 billion, now accumulatively exceeds $2 trillion and is more than twice what it was in 1981. In recent years, about a third of the debt has been covered by borrowing from foreigners. The budget deficits have caused massive borrowing in the public sector, reduced the availability of money for business investment, and resulted in high interest costs for corporate investment and, accordingly, a risk-taking disincentive. The cost of capital in the United States is higher than in any other industrial country in the world. Perversely, the interest rates must be high in order to attract the foreign funds needed to finance the federal deficit.

The United States has the lowest rate of savings of any industrial country in the world; it is the lowest American savings rate since 1949. It

is a related phenomenon that the United States has by far the highest rate of consumer debt. Americans are maintaining earlier life styles, in keeping with their expectations, by borrowing and by becoming two-income families. Real income for Americans, as adjusted for inflation, declined by about 5% during 1973-1985, while the culture continues to emphasize consumer values rather than productivity.

The low rate of savings causes the United States to lag in capital formation and investment in plant and equipment. In 1983, the average age of American industrial equipment was 16-17 years, versus 12 in West Germany and 10 in Japan.

It follows that the United States has the lowest rate of productivity growth of any of the major industrial countries. Productivity is related to demand, and demand is now subject to global competition. The United States cannot depend on its domestic markets alone; it must compete in the global marketplace to sell its products. Overall national productivity will not increase without growth in the export sector. Weak performance in trade is a powerful reason for weak economic growth, while a very long-term trade surplus must be achieved to absorb foreign-accumulated dollar earnings which are not invested in the United States and indeed just to pay the annual interest of perhaps $50 billion on America's foreign debt. It will take years of effort to reverse the imbalance.

The situation calls for urgent attention and widespread understanding among the American people. We cannot continue indefinitely to borrow part of our standard of living from abroad. The longer it takes to reverse the trade deficits, the greater will be the sums of American income sent abroad to service the debt and the lower will be the American standard of living and the credibility of American leadership internationally. The major American

challenge for the years immediately ahead is to reverse the loss of competitiveness which negatively impacts all Americans.

New England in the pattern

New England, despite its exceptionally strong economy of recent years, has seen its own export trade growth curbed in line with the escalating national trade deficit. At the outset of the eighties, export trade was projected as one of the fastest growing sectors of the New England economy because of strength in high technology, finance and professional services. U.S. Department of Commerce data released in 1986 shows, however, that total export employment for manufactured products in New England actually fell from 232,900 in 1980 to 177,000 in 1983, a decline of 24%. Exports declined from 11% of New England's gross state product to 8% during that same period. Furthermore, the Massachusetts Port Authority estimates that in 1985, the New England trade deficit increased more rapidly than that of the nation overall. That is not very surprising; the propensity to import tends to increase with income, and New England, as the most prosperous region in the country for several consecutive years, had greater spending power to take greater advantage of high quality, low-priced import goods.

Strategies for competitiveness

Competitiveness is a long-term problem requiring long-term strategies; there is no quick fix. It has a multitude of causes; there is no single solution. Overcoming the problem requires an inter-related set of strategic approaches involving all three major sectors: government, business and higher education. The following paragraphs will introduce the strategic handles or ways in which each of these sectors is relevant. The treatment will be brief

and non-prescriptive. The purpose is to provide a context for focusing on one of the cross-sectoral strategic handles: international knowledge.

Role of government. Vulnerabilities involving employment, prosperity, and the position of the United States in the world create expectations that there will be political answers to problems. The competitiveness issue involves relations between countries, and, crucially, business operates within a framework of public policies. National political leaders have been seeking to take action helpful in advancing competitiveness. Much of the reporting on the competitiveness issue has focused on the shaping of federal policies, some of which are sharply controversial.

The most effective action has already been taken. The federal government has been instrumental in effecting the lowering of the price of the dollar by 40% against major currencies, thereby reducing the price foreigners will pay for American goods while reducing the American incentive to buy foreign goods and travel abroad. The positive effect upon the trade balance will be major and will gain momentum, but the turn-around may not be quick: not all currencies are affected, customer relationships have become established, and spare parts will be ordered for foreign equipment, which may not need to be replaced for a long time.

The White House has focused on the prevention of unfair foreign practices such as the dumping of goods at prices below costs, as well as upon removing foreign procedural barriers to the importation of American goods. It has also encouraged West Germany and Japan to stimulate domestic demand. Another government strategy is to strengthen rules governing intellectual property, namely patents, trademarks and copyrights, in order to protect American products. Additionally the government is considering how it can organize itself to focus more coherently and effectively toward improving

competitiveness.

The U.S. Senate and House of Representatives have been focusing on an omnibus trade bill, some of whose many provisions have been extremely controversial. One concerns Presidential flexibility in giving domestic industries temporary protection from rising levels of imports and would involve judgments as to whether the cost to the overall economy might exceed the value of the aid to the industry seeking help. The other, in the Senate version, would call for retaliation against nations that exhibit consistent patterns of unfair trade practices; in the House version it would order the President to impose tariffs or quotas on countries having large trade surpluses with the United States. The substantial opposition to the latter action is based on concern that it invites retaliation at a time that the cheaper dollar is beginning to have the effect of increasing foreign purchases of American goods and reducing American purchases of foreign goods.

The business community favors tax laws which encourage individual savings and corporate investment as well as reductions in the large federal budget deficits. Many corporations would also appreciate relief from formally imposed production standards, such as those intended to promote safety and environmental protection, which increase the cost of production.

Other federal strategies involve the provision of financial support to advance basic research, retrain workers, overcome illiteracy, and improve basic, scientific and international education in order to have a workforce competent to meet the competitiveness challenge scientifically, technically and internationally.

In complement, state governments are offering tax incentives to attract foreign investment in job-producing industries, sending missions abroad for this purpose and to promote local products and providing services to assist their state's firms in developing foreign markets.

The influence of government actions can be great, both positively and negatively, yet it is fundamentally limited, as government does not produce or sell the goods which are the basic ingredients of American competitiveness. Government policies alone cannot assure the competitiveness of the American economy.

Role of business. The central sector in determining American competitiveness is business, and the key is manufacturing, which has been the principal agent of American economic growth and accounts for three-fourths of American exports; herein the comparative advantage is in high technology, in which competitiveness requires constant innovation. Agricultural export remains important, and indeed there are more acres in the United States producing food for Japan than there are in Japan, but technological progress has resulted in increasing self-sufficiency around the world and a reduced market for American farm goods; nonetheless, the lower price of the dollar is likely to boost agricultural exports significantly. While American services are important internationally in communications, transportation and finance, many services are labor-intensive, personalized and difficult to export. The American export future must be based on manufacturing.

The American corporate community is undergoing extraordinary change, becoming restructured by mergers and acquisitions, by movement from the old smokestack industries into high technology, and toward multinational enterprise involving the manufacturing of components abroad. All of these developments are related to the changing conditions of competition, which in large part are associated with the internationalization of the economy.

There has been considerable discussion of what corporations can do to advance American competitiveness, and advice has flowed readily: automate in order to improve product quality control and reduce labor costs; shift from short-term profit maximization toward investing in long-term strategic objectives; increase research and development capabilities and find ways to be quicker in developing new technologies commercially; assure that corporate restructuring be focused in ways that will enhance global competitiveness; develop personnel policies which encourage thinking globally; develop markets abroad and design products appropriate to foreign markets.

These general prescriptions, of varying appropriateness in different circumstances, call for strategic thinking to meet the fundamentally changed business environment of the competitive global economy.

Role of higher education. It is a truism that what we can do in the global economy is shaped by what we know. Education at all levels becomes important.

In the knowledge-based economy which also is global, the activities of colleges and universities are an increasingly important factor for American competitiveness. Our comparative advantage in the global economy is based on innovative productivity, technical skills and high levels of knowledge. Newly industrialized countries can master routines and make excellent products at low cost. In contrast, our competitive base is in new products and therefore in innovative thinking, research and development, and, also necessarily, in dealing competently cross-culturally in management, marketing and other aspects of business. In all these regards, colleges and universities underpin our competitiveness.

Higher education provides the research foundation for product innovations, producing two-thirds of the basic research in the United States. It educates the scientists and engineers who give American corporations their product advantages. It educates the managers who lead businesses, prepares professionals for their specializations, and shapes the understanding of those who become employees, stockholders, voters and political leaders. As a creator of high technology, the scientific university has been a catalyst in the building of the global economy, whose development in turn creates needs for new learning to ensure American understanding of an effective participation in that new economy.

Higher education has a major stake in American competitiveness, drawing its revenues from employed families, tax monies derived from private sector profits, interest from endowments invested in corporations, and donations and research support from corporations. A leading generator of economic productivity, it is a central and driving force within the New England research community, which is the foremost concentration of research and development activity in proportion to population of any region in the world. MIT alone has in effect spun off hundreds of high tech corporations, which employs tens of thousands of people, and it is such research and such technologies that are the key to our future economic performance. In sheer dimension, higher education is a major element in the economy. Total 1985-86 expenditures for the 3,331 institutions of higher education in the United States exceeded $102 billion; colleges and universities employed two million persons and served 12.3 million students. In New England there are 270 institutions with 800,000 students, an aggregate budget exceeding $8 billion, and spillover effects into the economy of more than $20 billion. High tech and service firms, American and foreign, are attracted to the knowledge

centers and cultural ambience provided by higher education, while higher education itself has become one of America's major export sectors, whose contacts, services, and student clientele are global.

In contributing to competitiveness, higher education faces two fronts, one technical and the other international. Far more attention has been focused on the technical side, which is crucial to product development. The Massachusetts High Tech Council, consisting of 200 companies, projected corporate demand for highly trained technical personnel and thereafter developed the "Two Percent Solution" whereby member companies contribute a share of their corporate research and development budgets for basic and applied science at colleges and universities. The corporations have contributed to the renewal of laboratories. Following a sharp increase in the number of engineering baccalaureates in New England, the High Tech Council is now addressing the follow-on problem of shortages of Ph.D.'s and high quality faculty.

On the technical front, there is discussion across the country of the following five strategic approaches:

(1) Improve university research facilities. The equipment is extensively obsolete, on the average twice the age of equipment in industry; new equipment is increasingly complex and expensive.

(2) Increase budgets for research projects in areas having commercial promise as well as in basic research. The federal government finances nearly half of the country's research and development, but 70% of this funding is devoted to defense and space research, to which America's competitors assign relatively little of their resources.

(3) Involve higher education more expansively in joint technology development with business and government in order to focus more talent on the commercially relevant and help industry to move more quickly into product development.

(4) Assure the availability of information about foreign research to American researchers, perhaps by providing abstracting and translation services.

(5) Focus on developing scientific, engineering and technological personnel. American graduate student enrollment in chemistry, physics and mathematics has not increased in the 1980s, and fewer students are earning doctorates and joining faculties in these fields. In engineering fields there may be as many as 2,000 faculty vacancies nationally, and a quarter of the nation's current engineering faculty members are expected to retire by 1995. The number of American engineering students has been increasing slowly but steadily across the last decade at both the undergraduate and graduate levels. Meanwhile, the number of foreign engineering students at American institutions has been increasing dramatically to the point that a third or even half of the total enrollment in many departments is foreign and foreigners earn 40% of all engineering Ph.D. degrees awarded at American universities. Necessarily, there are growing numbers of foreign faculty members. There is discussion of ways to increase the incentives for Americans to pursue careers in these fields.

There are also qualitative issues, some related to faculty development and some to shifting emphases. There is growing concern that there be greater attention to manufacturing engineering. This concern is stunningly reminiscent of that expressed in the 1980 British report, Engineering Our Future, which stated that [1]

> For many years Britain's performance as a manufacturing and trading nation has been in relative decline with her major competitors.... reversing this decline is possible only through the regeneration of Britain as a manufacturing nation.... engineering excellence.... in manufacturing enterprises.... is essential to continuing competitiveness.

It is noteworthy, in parallel to the concern about manufacturing engineering, that only 4% of the 1986 graduates of Harvard's Graduate School of Business entered the field of manufacturing production, while the majority went into investment banking, consulting or finance.

As engineering work increasingly combines technical and international aspects, there is growing concern that engineering education become more international. There is growth in engineering contract work abroad, and it is increasingly important for engineers to comprehend international competition, markets and manufacturing. Product design frequently must allow components to be produced in other countries, with the consequence that technology transfer into other cultures becomes part of engineers' work.

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[1] Engineering Our Future, Report of the Committee of Inquiry into the Engineering Profession, Sir Montague Finniston, Chairman, Cmnd 7794. London, 1980, pp. 7, 23.

In summary, this section on strategies for competitiveness has identified nearly 20 strategic approaches involving the three inter-related sectors of government, business and higher education. This section has indicated also, with reference to engineering, that the two fronts of higher education, namely technical knowledge and international knowledge, are not mutually exclusive but need to be joined. Higher education has not addressed the international dimension of its possible contributions to competitiveness as systematically or consequently as it has its technical and scientific possibilities. In the context established in the preceding pages, international knowledge will become the theme of this paper. We turn next to its strategic importance among the factors contributing to Japanese competitive success.

Lessons from Japan; international knowledge as business strategy

The pertinence of Japan is stark. It is the Japanese challenge that most clearly signals the problem of American competitiveness. In a survey in which American businessmen mentioned the countries they regarded as the most formidable competitors, 75% named Japan, 55% West Germany, and 23% the United Kingdom.[2] Japan specializes to a considerable extent in the same high technology fields as New England. Both the American problems of competing in the Japanese market and the Japanese success in competing in the global market convey implications for the development of American higher education.

For Japan, exporting has been a necessity and the key to economic growth. Lacking in natural resources, Japan must export to pay for raw materials, energy and food. The most urgent task after World War II was to create employment by winning export orders. A slogan of the time was "export or die." In support of the overriding export objective, government and corporations worked together to boost Japanese competitiveness, and education was the third partner, preparing people for roles in industry. Decade by decade, Japan's success gained momentum.

The dimensions of Japan's success are stunning. Japan's economy has become the world's second largest to the American and the most dynamic, leading the world in rates of productivity, trade balances and savings. Its productivity in manufacturing has increased more than 8.2% per year across the last 25 years, versus 3.3% for the United States. In high technology, New England's special niche, Japan has been achieving by far the world's

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[2]Egon Zehnder International, Corporate Issues Monitor (Vol. 1/3, 1986), p. 4

fastest growth. Japan has become the world's principal creditor country. It owns one-fourth of the world's total bank assets, displacing the United States, at 18%, as the world leader. Four of the world's five largest commercial banks are Japanese. It is conceivable that Japan's investment in foreign securities could reach one trillion dollars by 1995. Japan accumulated, in 1986, a trade surplus of $81.7 billion with the rest of the world.

Of that sum, $58.6 billion constitutes Japan's trade surplus with the United States, the difference between $85.5 billion in sales to the United States and $26.9 billion in imports from the United States. The United States buys 35% of Japan's exports, and its trade deficit with Japan is more than one-third of its total trade deficit even when Japan accepts "voluntary" quotas limiting some categories of shipments to the United States. Table 3 indicates the major elements in United States-Japan trade:

Table 3
Trade Between the United States
and Japan in 1986
(billions of dollars)

Major U.S. Imports		Major U.S. Exports	
Automobiles	$22.01	Aircraft and parts	1.83
Office machines	7.55	Chemicals	1.62
Consumer electronics	7.13	Office machinery and computers	1.38
Trucks other motor vehicles	5.88	Logs and lumber	1.10
Telecommunications and sound equipment	5.55	Corn	0.88
Motor vehicle parts	3.26	Soybeans	0.84
Steel mill products	2.45	Coal	0.56

Source: U.S. Department of Commerce

The formidable power of Japan in the global economy is likely to increase. Japan has accumulated resources and has learned to do things well and to adjust readily to external change. It is moving creatively beyond its earlier adaptation of others' ideas in developing its products toward scientific and engineering leadership. To a considerable extent Japanese product quality assures a high level of export sales even at higher prices. The recent lower price of the dollar, which since 1985 has fallen by 40% in relation to the yen, is reducing American demand for Japanese goods, yet also encouraging the Japanese to make major, advantageous investments in the United States. It stimulated $7 billion of Japanese investment in the United States in 1986, growing to a rate of $1.5 billion monthly in 1987, and will result in long-term repatriation of American profits to Japan. This investment includes commercial real estate as well as manufacturing; by 1990 Japanese firms will have the capacity to make 1,500,000 cars per year in the United States.

The main reason Japan's success is likely to continue is that it is focusing upon those fields which are at the forefront of economic promise. It has a record of doing this and moving toward market leadership. For example, whereas the United States produced nearly 90% of the world's color television sets 25 years ago, Japan now produces more than half and has 90% of the world's video-recorder market; whereas the United States then produced nearly half of the world's automobiles, it is now Japan that is producing nearly half.

Leading fields of the future include high technology ceramics, photovoltaics, biotechnology, and semiconductors. In each the United States had the early research and manufacturing lead and continues to lead in research while Japan has efficiently taken the lead in manufacturing and marketing. In 1978, the United States had 90% of the worldwide market in photovoltaics, but now the Japanese have half the world market. The Japanese

have the advantage of producing within mammoth, vertically-integrated companies which are able to finance developmental costs and market at low cost. Their success in memory chips, which yield high profits, helps them to finance the development of other semiconductor products. In semiconductors the Japanese have advanced so quickly that the survival of major segments of the American industry is questionable and the Pentagon's Defense Science Board on Semiconductors has recommended subsidized ways to meet United States defense needs. Beyond defense, Japanese technological leadership in an industry which is basic to other industries implies the development of a much more general competitive advantage. Forthcoming advancements in semiconductor technology will beget further manufacturing competition, with Japan certain to be the main competitor.

In 1986, Hitachi replaced General Electric as the company winning the greatest number of U.S. patents. Indeed, of the top 20 businesses receiving U.S. patents in 1986, nine were foreign and seven of them, including two of the top three, were Japanese.

There is no single meaningful explanation of Japanese success. It is in part attributable to a set of inter-related relationships involving government, industry, banking, cultural factors and education. Government is a partner in development, sometimes guiding and orchestrating corporate strategic planning in new directions through the Ministry of International Trade and Industry (MITI). MITI targeted biotechnology as a field for comprehensive effort, committed seed money, and was instrumental in establishing the Biotechnology Development Center, with 120 member companies; in 1985, six government agencies spent more than $134 million on biotechnology research. In such manner and across a broad front, government is becoming a major patron of basic research in a country in which research is generally

performed within corporations and is applied in focus, but now increasingly is going to be basic in order to promote more fundamental creativity.

Already it is perceived that Japan will be the strongest competitor in superconductors. Immediately following announcements that American firms were achieving extraordinary advancements in superconductivity research in 1987, the Japanese government organized councils for the purpose of coordinating efforts by companies, universities and government agencies to find commercial applications for superconductors.

Government also provides tax incentives for manufacturing investment and export activity. Banks, in complement, provide interest-only payment schedules for firms focusing on research and low-cost loans to support export activity.

The central actor in achieving competitiveness is of course the corporation. Corporations work within a culture which emphasizes mutual support among employees, perhaps a heritage from the rice culture and the cooperative management of its irrigation systems. There are strong bonds of loyalty in Japanese corporations, the team spirit reinforced by a general assumption of lifetime employment. Corporate strategies have included both applied research toward making frequent incremental improvements and careful quality control at all stages of the manufacturing process. There is a great emphasis upon production engineering toward increasing efficiency and reducing cost while improving products. In complement, the strategy typically involves patterns in opening markets rather than the gaining of immediate profits.

The Japanese are aggressive in their foreign marketing, gaining information directly from wholesalers, retailers and consumers in other countries in order to improve their marketing and service and to provide insights about possible product improvements to their manufacturers. This

kind of marketing research has contributed to Japanese product competitiveness in the American market; it is a direct linkage of "grass roots" international knowledge to economic competitiveness.

Some Americans do export to Japan. What can we learn from them? It is a myth that Americans cannot sell goods in Japan, and it is instructive to examine the conditions under which Americans are successful. In 1986 the United States share of all foreign investment in Japan was over 70%. While American per capita consumption of Japanese goods was approximately $370, Japanese per capita imports of American goods amounted to approximately $225. Vernon Alden has pointed out that:

* More than 50,000 U.S. products are being sold in Japan, U.S. companies are represented in more than 85% of Japan's 126 industrial sectors, and at least 12 hold the number one market position in their fields. In the soft-drink market, Coca-Cola has a 60% share; Warner-Lambert's Schick razors hold 71% of the safety-razor market; and McDonald's is the top fast-food chain in Japan.

* American high-technology companies have come on strong, including IBM with 1985 sales of $3.5 billion; Digital Equipment, whose Japanese sales have grown ten times in the last seven years; and Polaroid, with 66% of the Japanese instant-camera market.

* Since 1982, U.S. computer sales to Japan have increased by 48%; telecommunications equipment, by 38%; pharmaceutical products, by 41%; and electronic parts, by 63%. 3

It is possible to generalize about the requisites of success. The successful have learned to work cross-culturally with Japanese values and processes and to shape their products to suit the Japanese market. In a society of close group relationships, one cannot succeed in business without developing close cooperation with Japanese firms and thus becoming an accepted part of interdependent relationships, with their patterns of favors and

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3. Vernon R. Alden, "Who says you can't crack Japanese markets?" Harvard Business Review (January-February 1987) p. 52. On the cultural understanding required to do business in Japan, see Larry J. Rosenberg and Gregory J. Thompson, "Deciphering the Japanese Cultural Code," International Marketing Review (Autumn 1986), 47-57.

obligations, including the provision of security in some form. One cannot hire first-rate Japanese managers otherwise. Sensitivity and cultivation in these regards are important also for success within the complex retail distribution system and affects the treatment accorded by government. One must also tailor products to Japanese sizes, standards and tastes, utilize appropriate promotional images, and package goods in ways that appeal to Japanese consumers. Becoming established profitably requires patience and usually years of effort. Massive evidence sustains the basic point: one must understand the Japanese culture to work successfully in Japan's business environment.

Ongoing gradual cultural change will probably be helpful to American firms. The values of lifetime employment and promotion on the basis of seniority are slowly losing salience, the latter undermined by attention to rewarding creativity. Job-changing is increasing, and surveys indicate that most people under 30 would prefer such change during their careers. Applications for employment in foreign companies increase yearly, in part because these firms are perceived as more likely to reward performance rather than seniority. In 1986, 15,000 Japanese applied for employment with the Digital Equipment Corporation, a company based in New England which has learned to work well and recruit effectively within the Japanese culture.

There is increasingly a new dimension to the need to understand the Japanese as a growing number of corporate strategies will involve partnerships and joint ventures with Japanese firms to develop technology, to combine aspects of American research and elements of Japanese production, and to gain access to new markets. There is a clear logic behind these developments: one cannot ignore the Japanese competition, nor would American protectionist policies inhibit Japanese success in the global market, and in many fields each country has something to offer to the other; thus partnerships have

become a national strategy for advancing American competitiveness. A good example of a successful partnership is that of Integrated Genetics and Toyoba, involving Japanese funding for Massachusetts research, the exchange of technologies, royalties to Integrated Genetics from Toyoba's sales, and a diversifying relationship. In pursuing competitive strategies which include cooperative arrangements, Americans must work cross-culturally. The achievement of cross-cultural understanding, in turn, is in large part a function of educational strategies.

Education has been one of the key elements in Japan's economic success. Japan spends a larger share of its GNP on education than does the United States, 8.6% versus 6.8%. In the United States recently, there has been lively attention to Japan's greater achievement in precollegiate education and its disproportionately greater production of engineers and scientists. There has been little attention to the way in which Japan undertakes international education, yet in this regard also there are profound implications for the United States.

Precollegiate education is much more rigorous in Japan than in the United States. Structurally, the 6-3-3 system of elementary, middle and high schools is parallel to that in the United States, a result of recommendations made by the United States Education Mission after the Second World War. However, the Japanese people generally place more emphasis upon educational achievement than do Americans. At base is a Confucian and Buddhist heritage which carries a tradition of respect for education, while the Japanese culture also underscores the importance of hard work and diligence. Lacking material resources, the Japanese consider the intellectual development of the workforce essential to economic development. Economic planning has included planning for educational development, especially the promotion of mathematics and

science skills and knowledge needed to enhance productivity and competitiveness. For the Japanese, educational attainment has become the pa.) to both social and economic status. Families closely support their children's learning at home and, commonly, by obtaining the services of tutors. Teachers have high professional status and corresponding compensation.

In Japan, pupils attend school five and a half days per week and, including Saturday mornings, 240 days per year, versus 180 days in the United States; minimally there must be 195 days of formal instruction, exclusive of other sponsored activities. Japanese children study English in grades 7 through 12 and gain a good grounding in world history. Testing by the International Association for the Evaluation of Educational Achievement establishes that Japanese children have the world's highest level of achievement in mathematics and science. Moreover, Japanese education is mass education, with a very low rate of attrition; 94% of Japan's young people undertake some form of secondary level education, and 88% of this group achieves graduation. In overall effect, Japanese high schools achieve considerably more substantively than do American high schools, and the Japanese work force is better educated than the American.

The Japanese learning system is keenly competitive and culminates in extraordinarily rigorous entrance examinations into the universities; admission to the very best is the key to career success in the corporate and public sectors. After high school, nearly two-thirds of Japan's young people move on to employment in a company while more than one-third enroll in higher education institutions. The numbers and variety of each institutions are impressive, as in New England.

The production of engineers and scientists has been a second major Japanese educational achievement. Although its population is only half that of the United States, Japan has begun to produce significantly more people for

engineering and scientific careers. In 1982, American colleges and universities educated 54,000 engineers and scientists, two-thirds of whom gained employment in defense industries, while Japan educated 78,000, nearly all of whom became engaged in civilian commercial companies. The numbers achieved were a consequence of higher education policy which was initiated by the government to meet personnel objectives desired by the business federation to assure economic development.

International education is crucially important for the Japanese: they speak a language not spoken beyond their own country, yet must sell abroad to survive; they have needed to observe others in order to gain ideas essential to their own competitiveness about what to produce, and they have had to analyze foreign needs and preferences and how to manage, market and provide services in a variety of cultural contexts. For a people both isolated and homogeneous, international education is a special challenge.

Yet one does not find extraordinary international studies programs at the university level in Japan, and graduate education is generally far weaker than in the United States. Moreover, there is not a general pattern of close working relationships by which universities provide international expertise to corporations. Basically it is not to Japanese higher education that Japan looks for its international education. By looking at Japanese educational structures, one misses the dynamic connection between the Japanese approach to linking international education and Japanese economic competitiveness.

The Japanese approach has two aspects. One is study abroad. The number of Japanese studying in the United States in each of the three years 1983-1985 exceeded 13,000. As a Harvard Business School study points out:

> In the 1980's, for every American studying in Japan, approximately 15 Japanese students were attending universities in the United States. Considering the disparity in the two countries' populations, this represents approximately a 30-fold effort of Japan tounderstand the United States compared with that of the United States to understand Japan. 4

Few of the Japanese are in the United States to study American society in a formal academic sense. Regardless of their academic focus, however, the Japanese gain in their understanding of the United States and their ability to use the English language. Most of them are studying in scientific or engineering fields. Many develop enduring professional relationships and become closely familiar with American scientific thinking as well as research in progress. Some receive financial support from the Japanese government; others are sent by Japanese corporations.

Whereas the majority of foreign students in the United States are undergraduates, the overwhelming majority of the Japanese are graduate students, some of whom already have professional experience. Not all are pursuing degrees. Many are undertaking a year or two of advanced professional study at leading American research universities in order to gain knowledge which may have commercial applicability. In Japanese corporations, selection for such study is a special honor accorded to those of greatest career promise.

The Japanese regard MIT as the best place in the world to study in many technical fields, including semiconductor technology, robotics, media technology and high-technology ceramics. MIT educates more students from Japan than from any other major industrial country except Canada. There are more Japanese scientific researchers studying at MIT than there are American equivalents at all Japanese higher education institutions combined. Most of them are employees of Japanese corporations.

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4. Thomas K. McGraw, M. Colyer Crum, and Joseph Badaracco, Jr., "America versus Japan: A Collision Course?" in McGraw, ed. America Versus Japan: A Comparative Study. Harvard Business School Press, 1986. p. 382

MIT considers itself open to excellence from whatever source and values its international sources of information and talent. Its Industrial Liaison Program involves 320 member corporations, 55 of them Japanese. Japanese corporations have tended to be active members seeking long-term relationships, and some have offices in the Boston area which maintain contacts. In turn, the Japanese have contributed financially to MIT, supporting more research there than at any other American institution and endowing eleven professorial chairs. MIT maintains an office in Tokyo, and probably half of its engineering professors have visited Japan in recent years. Although MIT seeks to promote the access of American companies, the Japanese have generally and very advantageously moved their new learning into new product development more quickly than have their American counterparts.

The second aspect of Japanese international education occurs by corporate business postings abroad. There are approximately 150,000 Japanese residents, including dependents, in the United States, versus 30,000 American residents in Japan, not counting military personnel. The 5:1 ratio is a rough differential measure of bilateral international experiential learning in business. Japan's practice is global. American tax laws, among other factors, discourage overseas assignments. In American society, in contrast to the Japanese, the primary vehicle for international education is higher education. In part for this reason, the American approach to international education within higher education needs fresh reconsideration.

Finally, continuing education in Japan is a mass phenomenon. The most popular course is English, studied by millions. Although the quality of instruction, especially in spoken English, has at times been poor, the momentum of English-language study is such that we may anticipate that Japanese people quite generally will speak fairly good English by the turn of

the century. It should be understood that the United States is in competition not only with an economic system but also with a learning system.

New England leaders confirm that international knowledge is a strength

New England leaders confirm that international knowledge is a strength. This section will summarize the thrust of New England testimonial evidence, review the findings and implications of other studies, and conclude by reporting on survey research indicating New England leadership perspectives.

Eight linkages of competitiveness and international knowledge

Corporate and state trade office personnel, in interviews and discussions, linked competitiveness and international knowledge in eight ways: [5]

(1) need for knowledge to compensate for a weak tradition: From several companies we heard that American adjustment to the new global economic reality is proceeding too slowly because, unlike smaller countries with strong export traditions, the United States business experience has long been overwhelmingly domestic, its international economy essentially peripheral to the huge home base. Moreover, the United States has been the world's dominant economic power for the first quarter century after World War II, and the goods exported in that much less competitive era were largely those designed for our domestic market. From that period there is, in the words of an employee at the Dennison Manufacturing Company in Framingham, Massachusetts, "much lingering fantasy in the American imagination about our being better than others."

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[5] While time constraints limited these discussions to perhaps 20 people, the themes were recurring.

(2) linkage of productivity lag and parochialism: In the global economy as in the more distinctly domestic American one, competitiveness is a function of the interactive relationship between product development and market development. The development of foreign markets is necessary for American employment and productivity, yet there has been lagging recognition of a basic linkage in the global economy: parochialism is a cause of productivity lag, and lagging productivity impairs competitiveness, resulting in a disadvantage in world markets. Participation in foreign markets is helpful to one's position in the domestic market: it enhances skills and challenges bases of one's competitors' strength. As the technological capabilities of other countries increase, U.S. competitiveness could decrease if foreign firms are more skillful in adapting and interacting internationally.

(3) increased export activity requires international knowledge: The trend toward massive trade deficits must be reversed, and while many American companies do well in the global economy, some could do better, and not enough companies are involved in export-related activities; perhaps only 250 firms account for 80% of American exports. The reasons for weak participation are several. A firm may lack linkage to a support system, for example a network of brokering middlemen, distributors or product and market consultants. More fundamentally, competitiveness is affected by commitment to exporting, which is a function of two factors: management's perception that there can be a worthwhile export market and the procedural knowledge needed to participate successfully. To believe that exporting can be worthwhile, one needs to have market knowledge and the ability to assess risks and the relationship of costs to profits, given expenses in shipping, insurance and market development. One also needs to know about the technical aspects of export activity and, more profoundly, the way the local culture affects the operational aspects of doing business. The old adage about what is required to succeed in business remains

valid: know your product, know your customer.

This point is made strongly in Greater Portland magazine, which for its special fall 1987 issue on "Portland in the World" interviewed local people doing international business. [6] Said AgriTech Vice President Chet Crum: "You must know what the people are like. Their beliefs. Their heritage. The macro- and micro-economics of a country. It's not enough to understand your customer's needs. You must understand your customer." Summarizing its local voices of experience, the magazine said: "A producer must be familiar with what foreign customers buy, how products are sold, and the characteristics of the many foreign cultures."

Businesses small and large have to have good answers to four questions: Where can we sell? How can we sell? How can we deliver? How do we get paid? To get the answers, they have to become familiar with foreign situations. Having a background which includes some such familiarity predisposes one toward engaging in international activity, while lack of background is inhibiting. Providing background familiarization is appropriately a function of colleges and universities, which substantially shape the American mindset.

(4) management must have international knowledge: Nowadays the pertinence of international knowledge increasingly goes beyond exporting to management. Perhaps as much as 40% of New England's trade occurs within multinational corporations. Such firms have global strategies, global operations and international personnel. These circumstances require managers who think in global terms, understand their firms' worldwide operations, and interact effectively with foreigners.

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[6] "Portland in the World," special issue of Greater Portland, a publication of the Chamber of Commerce of the Greater Portland Region, 31:3 (Fall 1987), p. 25, 28.

The importance of management skills is underscored in the findings of the 1986 survey of the 100 midsize, high tech firms belonging to the American Business Conference,[7] which includes 19 New England corporations. The ABC companies have been extraordinarily successful internationally: between 1980 and 1985 their annual growth rate in international sales exceeded 27%; their share of total revenues derived internationally rose from 13.6% in 1982 to 22.1% in 1985. The survey showed that "ABC executives believe that international competitiveness is largely a question of managerial will and skill." The ABC executives stated that cultural preferences were the most common foreign barrier to trade, not tariffs or discriminatory regulatory standards, which were ranked second and third. "Overcoming cultural chauvinism," says their report, "is essentially a function of the will and skill of American managers."

(5) global perspective is essential: Especially financial leaders underscored one fundamental point: the economy is global, and therefore we need learning that is relevant to this new reality.

(6) international knowledge is not a substitute for business skills: technical, functional and organizational skills are of primary importance, but as American business increasingly becomes international business, the relevance of international knowledge and foreign language skills increases.

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[7] American Business Conference. The Challenge of Global Competitiveness: Views of America's High Growth Companies. New York and Washington: American Business Conference, 1987. 30p.

(7) most valued is how to operate cross-culturally, in negotiation, management, marketing, and inter-personal relations more generally.[8]

(8) knowledge of foreign languages can be profitable: New England businessmen indicated that foreign language knowledge is important in a variety of ways, including the supervision of foreign construction sites and, more commonly, in sales. Lou Rodero, who developed Latin American sales for the Safety Products Division of Norton Company, Worcester, Massachusetts, says that he was able to double the sales volume in several successive years largely because of his international knowledge: "You can always do business abroad without knowing the foreign language and culture, but you can do a lot more business with that knowledge in your background. In both quantitative and qualitative terms, the benefits are most significant."

At a time that 1,500 foreign subsidiaries are established in New England, it can be useful to know a foreign language while on the job in New England. James Feeney, President and Chief Executive Officer of a Rhode Island firm owned in Germany and having an entirely German board of directors, Windmiller and Hoelscher Corporation, has advertised in The Wall Street Journal and The New York Times for sales executives and technical personnel who can "effectively communicate in German with parent firm in West Germany." In order to minimize communications problems, it is a contractual requirement to communicate with the parent company in the German language. Feeney said:

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[8]Stephen Kobrin extends this point in his booklet, International Expertise in American Business (New York: Institute of International Education, 1984). He points out that while country-specific knowledge is important for some people and is very important in investment decisions, international managers in multinational enterprises generally do not find it advantageous to become single-country experts. They do find it important to have a global economic perspective and to understand the important differences across cultural, economic and political systems, as these differences affect business.

> When I'm looking for product managers to fill some of our key positions, what I need are well-rounded, technically trained, bilingual people. The harder I search for individuals like this, the more I realize that the current educational system in the United States just does not turn out people like this, and the contrast to the Germans and Japanese with whom we interface is embarrassing, especially as it concerns second language skills. I would like to hire Americans for this American company, who think and act like Americans, who also are strong technically, fluent in German, and are understanding of and sensitive to the German culture.

Knowing another's language improves the quality of communications and of relationships, in part because it demonstrates long-term interest in the other person's culture. It also tends to result in expanded access within a foreign society. While English is the most universal language of business, the Duke of Kent only a few years ago told the British Overseas Trade Board that [9]

> Britain's major customers give preference to firms who take the trouble to approach them in their own language. They are likely to react unfavourably to an approach made in English.....Fifty percent of French firms give preference to foreign firms speaking French. Fifty percent of German and Austrian firms require correspondence in German. British firms cannot expect their products to speak for themselves.

The study of the Japanese businessman who, when asked in what language he does his business, replied "the language of my customer," has become legendary. We know that colonialism, which developed linguistic ties among peoples, has had continuing effects on patterns of trade. Although computer software is extending the influence of the English language, there remains a larger validity in James Reston's distinction between the United States doing well in the "hardware of high tech" but being an underdeveloped country in the "software of language."

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[9]Quoted from Humphrey Tonkin and Jane Edwards, The World in the Curriculum: Curricular Strategies for the 21st Century. New Rochelle, New York: Change Magazine Press, 1981. P. 98.

Other studies and reports

In 1986 the Egon Zehnder International Company commissioned an inquiry into corporate perceptions of the internationalization of the economy and what American companies are doing to advance a global perspective. It asked a polling firm to survey 100 executives of corporations that rank among the 500 largest industrial and 500 largest service organizations and that have at least one foreign subsidiary. The interviews were telephonic, each lasting about 20 minutes. Table 4 presents some of the leading findings.[10]

Table 4
Zehnder Corporate Survey Findings
1986

To what extent do you agree or disagree with the following statements?	
Over the next five years, I expect that pressure on American companies to compete internationally will increase substantially.	
Agree strongly	71%
Agree somewhat	26%
Disagree somewhat	2%
Disagree strongly	0%
Not sure	1%
The greatest barrier to the ability of American corporations to expand into foreign markets is the failure of American management to seize opportunities already available	
Agree strongly	25%
Agree somewhat	42%
Disagree somewhat	22%
Disagree strongly	9%
Not sure	2%
Foreign markets are more open to American companies than most executives think.	
Agree strongly	11%
Agree somewhat	42%
Disagree somewhat	25%
Disagree strongly	18%
Not sure	4%
Employing special import quotas is a good way to reduce world competitive pressures on American companies.	
Agree strongly	3%
Agree somewhat	13%
Disagree somewhat	26%
Disagree strongly	55%
Not sure	3%

[10]Egon Zehnder International, USA, "Global Competition: Are U.S. Companies Meeting the Challenge?" Corporate Issues Monitor (Vol. 1/3, 1986), P. 2 of 4 page issue.

Some findings merit highlighting: 97% agreed that "pressure on American companies to compete internationally will increase substantially;" 96% agreed that their "company's ability to compete against foreign firms is essential to its long-term success;" 71% supported the prediction that "Generally, companies that do not actively pursue foreign markets will find themselves in dire straits in the next five years;" 56% anticipated that their company would acquire a foreign company within five years; and 36% indicated that their companies would expand non-U.S. production by 25% or more.

Also striking was the corporate leaders' perception of American management. While many expressed concerns about trade barriers, 67% agreed that the greatest barrier facing American corporations is "the failure of American management to seize opportunities already available;" 66% agreed that "American managers are woefully ignorant about foreign markets;" 53% believed that "Foreign markets are more open to American companies than most executives think." Finally, when asked why American companies were not selling more in other countries, 76% of the respondents mentioned that "American management lacks a global perspective."

The majority indicated that the percent of their firm's top 100 managers having significant international experience ranged from zero to 20%. In general, executives taking foreign assignments received no special recognitions, promotions or bonuses. Only 13% of the companies "to a great extent" operate "training programs emphasizing global thinking." These findings were in notable contrast to the expectation of 86% that future executives with international experience would be highly valued.

The Zehnder conclusion was unambiguous: the survey underscored corporate belief that the major problems of American competitiveness are not difficulties external to the firm, such as trade barriers, but rather the "lack of commitment, in the training of executives, to think transnationally."

While the Zehner survey focused on large corporations, a 1986 White House Conference on Small Business, involving more than 1,800 delegates from the United States and Puerto Rico, recommended that the Federal Government encourage, in the context of entrepreneurial free enterprise education, "the teaching of foreign languages and intercultural practices, to increase our national awareness of global economics and their interaction and to encourage a greater competitiveness by small business in international markets."

In parallel, the Business-Higher Education Forum, with the support of the Northeast-Midwest Congressional Coalition and the Congressional Clearinghouse on the Future, held a series of hearings around the country on the challenge of economic competitiveness. Consisting of 120 leading business executives and college and university presidents and chancellors as well as members of Congress, the group issued its recommendations in 1986. While much of its focus was on trade policies and research and development policies, it addressed the need for international knowledge in the framework of human resource policies:[11]

* Given the growing interdependence of the American and world economies, it is crucial that U.S. students and workers become more knowledgeable about other countries and cultures.

* Colleges and universities must significantly strengthen their international studies courses-language, cultural, political, economic - and make them readily available to U.S. business executives as part of their own lifelong learning programs.

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[11]Business-Higher Education Forum, et.al. An Action Agenda for American Competitiveness (1986), p. 23, 26. The Forum was founded in 1978 as an affiliate of the American Council on Education in Washington, DC.

Higher education has not played a very important role in the preparation of American managers engaged in international business. Stephen Kobrin, on the basis of data obtained from 233 international managers in 126 American companies, examined how international knowledge is acquired. Table 5 summarizes his findings: [12]

Table 5

The Acquisition of Country Knowledge

Factor	Percent Considering Critical	Percent Considering Important
Business Travel	60.8	92.0
Assignments Overseas	48.8	71.2
Reading/Television	16.0	63.2
Government/PeaceCorps		
Military/Religious	4.0	16.0
Graduate Course	2.4	15.2
Nonbusiness Travel	0.8	12.8
Undergraduate Courses	0.8	12.0

The most important factor has been experience abroad; managers have learned experientially: "They learn to play with the kids on the street by being there and doing it....the vast majority of managers did not mention college or graduate school as contributing to international expertise....Several who mentioned schooling talked about the value of a multinational student body or studying abroad."[13]

[12]Kobrin, p. 38.

[13]Kobrin, pages 40 and 41.

We might interpret Kobrin's findings to mean that education is lagging in relevance, that those who were sent abroad were perhaps not those who studied international subjects in college, or that universities should build an international experiential component into their programs. There is perhaps merit in all these interpretations, and in fact Kobrin found that a slight majority of those who went into international business did not do so at their own initiative but were either originally sent abroad to a particular job or were promoted into positions that carried international responsibilities. Overwhelmingly, they learned while on the job.

However, the opportunities to take overseas managerial assignments are decreasing, as foreigners now usually manage American subsidiaries abroad. Those assigned overseas now tend to have technical functions and go for short periods. Yet, as is readily observable, the internationalization of business is increasing, a steadily wider range of occupations is becoming involved, and New Englanders are operating internationally from New England. Table 6, also from Kobrin's study, shows clearly that internationalization is increasing while overseas managerial assignments in American firms are declining:[14]

Table 6

The Internationalization of Managers

	Percent Decreased	Percent Same	Percent Increased
Past 10 years:			
Assignments abroad	50.0	26.1	22.7
Americans involved internationally	13.6	18.2	67.0
In the future:			
Assignments abroad	40.9	39.8	18.2
Americans involved internationally	17.0	25.0	56.8

[14]Kobrin, p.43.

This situation led Kobrin to face the inherent issue of how then to develop the international knowledge of American managers: He concluded: [15]

> We shall have to make use of methods to develop an interest in and an understanding of the world outside the United States that do not depend on direct experience. A major burden will fall on the educational system, both formally in undergraduate and graduate courses, and informally through a variety of continuing education and inservice programs. Educational institutions and companies will have to find new ways to substitute education and training for experience. The sink-or-swim approach of the past will not meet the needs of the future.

The New England Leadership Survey

In 1987, the New England Board of Higher Education, in cooperation with the New England Center for Continuing Education at the University of New Hampshire, conducted a survey on "The Future of New England."[16] A leadership survey, it provided 824 replies from business, higher education and government leaders and higher education governing and policy board members regarding issues critical to sustaining and expanding the foundation for New England's future prosperity. More specifically, the four major groups completing the questionnaire were:

1.	Business Leaders (180 replies)	Chief executive officers of large and small companies located throughout New England
2.	Higher Education Leaders (168 replies)	Presidents of New England colleges and and universities
3.	Government Leaders (394 replies)	New England state legislature, governors and upper level staff of state governors' offices and New England's federal legislators
4.	Higher Education Governing and Policy Boards (82 replies)	Members of New England state higher education boards of regents, trustees, directors, planning commissioners and NEBHE board and commission members.

15. Kobrin, P. 53.

16. The survey project was undertaken with a grant from the W.K. Kellogg Foundation of Battle Creek, Michigan. The New England Center for Continuing Education is a cooperative venture of the six New England land-grant universities. For the full survey report, see NEBHE, The Future of New England: A 1987 Survey of Business, Government and Higher Education Leaders, 1987.

Among the topics covered were the internationalization of the economy and the response of higher education. Particularly striking is the similarity of perception across the four groups, with the occasional exception of the government leaders.

All respondents were asked to rank 19 public policy issues in terms of their importance to New England's future. Table 7 shows that nearly all the top issues are either economic or educational. It also shows that "preparing for international economic competition," which surely was not perceived as an issue half a dozen years ago, emerged in eighth place in the perception of business and higher education leaders, sixteenth place among government leaders, and seventh place among board members.

Except among government leaders, preparing for international economic competition was ranked by all other groups as more important to New England's future than such long-time issues as improving housing and run-down neighborhoods, providing affordable energy, conserving agricultural lands and natural environments, providing affordable health care, providing child care for working parents, educating youth for civic involvement and participation in the democratic process, providing job training for welfare recipients, reducing crime, and reducing racial discrimination. Government leaders shared the view that preparing for a global economy is more important than either of the last two named. In Table 7, the low ranking of the competitiveness issue in the column representing all four groups combined is attributable to the government sector providing the largest number of respondents. The reader will quickly see the rankings vary somewhat across the sectors.[17]

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17. In each of the following tables, the numbers exceed the number of respondents because they reflect a five-point scoring system in which a respondent's first choice was awarded five points, second was given four points, etc., with a respondent's fifth place ranking awarded one point.

Table 7

New England Leaders:
Public Policy Issues Important to New England's Future
1987

Ranking of Issues	All Sectors	Business	Higher Education	Government	Boards
1. Improving public schools	1790	461	419	732	178
2. Maintaining a strong economy	1467	357	306	643	166
3. Eliminating drug abuse	959	251	180	431	97
4. Improving higher education	726	137	243	251	95
5. Upgrading the skills of today's work force	657	159	162	278	58
6. Upgrading area infrastructure	631	180	111	287	53
7. Providing affordable health care	565	62	96	366	41
8. Conserving agricultural lands and natural environments	545	82	65	361	37
9. Educating youth for civic involvement and participation in the democratic process	512	87	158	211	56
10. Child care for working parents	484	47	79	329	29
11. Reducing pollution of air, water and land	478	77	91	258	52
12. Reducing the number of high school dropouts	427	59	152	171	45
13. Preparing for international economic competition	417	108	130	125	54
14. Improving housing and run-down neighborhoods	408	86	63	219	40
15. Providing affordable energy	404	64	74	242	24
16. Providing job training for welfare recipients	250	43	33	149	25
17. State tax limitations	249	109	8	96	36
18. Reducing crime	188	67	16	67	38
19. Reducing racial discrimination	70	12	36	13	9

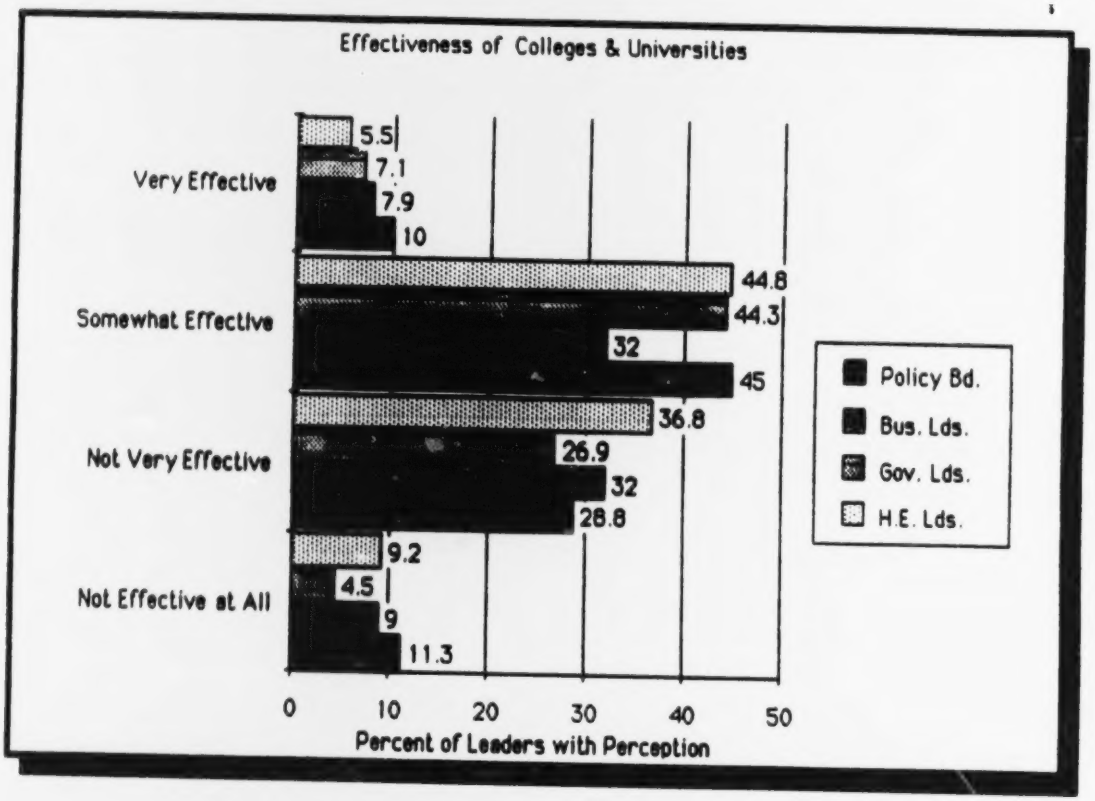
All leaders were asked to indicate, in four categories, the extent to which they perceived colleges and universities as effective in preparing the work force for the global economy. There was a wide range of perceived effectiveness in each of the four groups of respondents. Most leaders considered colleges and universities "somewhat effective" or "not very effective." It clearly is a widespread perception that higher education is

not very impressively effective. Business leaders' ranking included: not very effective, 32%, "not effective at all," 9%, and "I don't know," 19.1%. For higher education leaders, the results included: not very effective, 36.8%, and not effective at all, 9.2%. Figure 1 provides a comparison of the four leadership groups' opinions:

Figure 1

New England Leaders:

Effectiveness of Colleges and Universities
in Preparing the Work Force
for a Global Economy
1987



The most challenging action-oriented findings are in regard to the most important ways in which colleges and universities can prepare the work force for a global economy. Corporate, government and higher education leaders considered it most important to "design an undergraduate curriculum that ensures understanding of a global economy," ranking this challenge ahead of the need to "expand the supply of scientifically and technically educated men and women." Of all the responses, the one expressed in the first choice is the most bold and unconventional. It poses a new challenge, and it is noteworthy that it addresses general education. Perhaps a reason why colleges and universities are not perceived as effective in preparing the work force for a global economy is a perception that they have not provided a good general understanding of the transformation to a global economy. Table 8 provides the complete ranking:

Table 8

New England Leaders:
Most Important Ways Colleges and Universities
Can Prepare Work Force for a Global Economy
1987

Ranking of Ways	All Sectors	Business	Higher Education	Government	Boards
1. Design an undergraduate curriculum that ensures understanding of a global economy	1719	417	433	728	141
2. Expand the supply of scientifically and technically educated men and women	1419	327	277	647	168
3. Work with government and industry to improve technology transfer and diffusion of innovations	1088	185	203	573	127
4. Expand collaborative efforts with government, business and industry in basic research	998	188	170	505	135
5. Expand industrial liaison programs	732	136	139	379	78
6. Expand foreign language requirements	684	168	149	326	41
7. Expand international studies requirements	656	152	208	245	51
8. Create business internship exchange programs with other countries for U.S. students	651	169	161	271	50
9. Create new technology extension service programs for U.S. business and industry	564	112	101	294	57
10. Create cultural and educational student exchange programs with other countries	561	92	158	254	57
11. Expand foreign travel/study exchange programs for U.S. students	371	75	113	151	32
12. Expand professorial exchange programs with colleges and universities of other countries	333	72	105	128	28

Another action-oriented finding concerns communication across the business, government and higher education sectors. Most of the leaders in all the sectors foresaw a strong need for effective communication. Table 9 shows that, when asked to rank ways to increase communication, the leaders in all four groups of respondents favored the creation of business, government and higher education partnerships. While the notion of partnerships lacks specificity, the replies suggest a general openess to joint efforts.

Table 9

New England Leaders:
Specific Ways for More Communication Between
Higher Education and Business and Government Leaders
1987

Ranking of Ways	All Sectors	Business	Higher Education	Government	Boards
1. Creation of business, government and higher education partnerships	2281	458	577	1035	211
2. Improvement of the quality of teacher education	1241	284	204	630	123
3. Improved consultation with higher education governing boards on goals and priorities	1210	291	294	493	132
4. Consultation (one-to-one) by college and university faculty members with business and/or government	1069	276	229	441	123
5. Improved collaboration with the public schools in addressing high school dropout issue	1065	210	201	552	102
6. Improved consultation with regard to retraining the labor force	1050	194	209	493	80
7. Provision of technical assistance by college and university faculty provided as a public service	944	156	179	511	98
8. Publication of scholarly research effectively shared with business and/or government	500	107	79	241	73

Summary and challenge

This paper has linked competitiveness and international knowledge in three ways: as one strategic approach among a set of approaches to competitiveness; by a case study examination of the ways in which international knowledge is pertinent in Japan's success and in dealing with Japan; and by a discussion of why and how higher education needs to be involved in the United States.

We have learned from the New England survey data that New England leaders perceive a need to refocus what higher education is doing. There is a challenge ahead for educational leadership and creativity with regard to both business preparation and citizenship education for the global economy. The role of higher education is fundamentally important. Colleges and universities can make basic, low-cost, long-term and continuing contributions to American competitiveness by focusing on the relevance of international knowledge.